

AMENDMENTS TO THE CLAIMS:

Claim 1. (Canceled).

Claim 2 (currently amended): The implant of claim ~~1~~ ¹,
wherein said biocompatible coating is more biocompatible than
said structured surface.

Claim 3 (currently amended): The implant of claim ~~1~~ ¹,
wherein said biocompatible coating is more biocompatible than
said substrate.

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Claim 4 (currently amended): The implant of claim ~~1~~ ¹,
wherein said biocompatible coating is softer than said
structured surface.

Claim 5 (currently amended): The implant of claim ~~1~~ ¹,
wherein said biocompatible coating is softer than said
substrate.

Claim 6 (canceled).

Claim ⁶7 (currently amended): The implant of claim ~~1~~ ⁹,
wherein said thin film technique includes at least one
deposition process selected from the group consisting of
physical vapor deposition and chemical vapor deposition.

[Claim 8 (canceled).]

Claim ¹9 (currently amended): ~~The implant of claim 1,~~ An
implant, comprising:

^{B6} a substrate;

a structured surface formed on at least a portion of said

^{cont} substrate; and

a biocompatible coating deposited on at least a fraction of
said structured surface;

wherein said structured surface includes a plurality of
undercuts, and said biocompatible coating coats said plurality
of undercuts in said structured surface;

wherein said coating is formed by a thin film technique
adapted to deposit said coating on line-of-sight hidden surfaces
within said plurality of undercuts of said structured surface;
and

wherein said structured surface is porous and said biocompatible ~~material~~ coating coats interconnected pores ~~beneath~~ within said structured surface.

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Claim 10 (currently amended): The implant of claim ~~1~~ ¹ ~~9~~,
wherein said substrate includes at least one material selected from the group consisting of carbon-composite, stainless steel, cobalt-chromium, titanium alloy, tantalum, and ceramic.

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Claim 11 (currently amended): ~~The implant of claim 1, An~~
Cont implant, comprising:

a substrate;

a structured surface formed on at least a portion of said substrate; and

a biocompatible coating deposited on at least a fraction of said structured surface;

wherein said structured surface includes a plurality of undercuts, and said biocompatible coating coats said plurality of undercuts in said structured surface;

wherein said coating is formed by a thin film technique adapted to deposit said coating on line-of-sight hidden surfaces

within said plurality of undercuts of said structured surface;
and

wherein said structured surface is defined by a material that includes a plurality of particles that are sintered together to form a continuous porous phase.

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Claim 12 (currently amended): ~~The implant of claim 1,~~ An
implant, comprising:

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a substrate;

a structured surface formed on at least a portion of said
substrate; and

a biocompatible coating deposited on at least a fraction of
said structured surface;

wherein said structured surface includes a plurality of
undercuts, and said biocompatible coating coats said plurality
of undercuts in said structured surface;

wherein said coating is formed by a thin film technique
adapted to deposit said coating on line-of-sight hidden surfaces
within said plurality of undercuts of said structured surface;
and

wherein said structured surface is prepared by at least one method selected from the group consisting of sintering, flame spraying, acid etching, grit blasting, casting-in, forging-in, laser texturing, and micromachining.

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Claim *13* (currently amended): The implant of claim *± 9*,
wherein said biocompatible coating includes at least one material selected from the group consisting of titanium, tantalum, carbon, calcium phosphate, zirconium, niobium, hafnium, hydroxyapatite, and tissue in-growth and/or on-growth facilitating proteins.

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Cont *9/*
Claim *14* (currently amended): The implant of claim *± 9*,
wherein said biocompatible coating includes multi-layers.

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Claim *15* (currently amended): The implant of claim *± 9*,
wherein said biocompatible coating includes nano-layers.

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Claim *16* (currently amended): The implant of claim *± 9*,
wherein said implant is an orthopedic prosthesis.

12
Claim 17 (currently amended): A method for orthopedic surgery which comprises surgically positioning said implant of claim ~~1~~ 9, within a vertebra in need thereof.

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Claim 18 (currently amended): An osteoconductive process, comprising contacting a bone under *in vivo* conditions with said implant of claim ~~1~~ 9.

B6 [Claim 19 (canceled).

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Claim 20 (currently amended): The composition of claim ~~19~~ 14, wherein said biocompatible coating is more biocompatible than ~~said the~~ structured surface.

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Claim 21 (currently amended): The composition of claim ~~19~~ 27, wherein said biocompatible coating is more biocompatible than ~~said the~~ substrate.

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Claim 22 (currently amended): The composition of claim ~~19~~ 27, wherein said biocompatible coating is softer than ~~said the~~ substrate.

14/20 Claim 23 (currently amended): The composition of claim 19
27, wherein said biocompatible coating is softer than ~~said~~ the
substrate.

[Claim 24 (canceled).]

36/21
Cont Claim 25 (currently amended): The composition of claim 19
27, wherein ~~said~~ the thin film technique includes at least one
deposition process selected from the group consisting of
physical vapor deposition and chemical vapor deposition.

[Claim 26 (canceled).]

16/ Claim 27 (currently amended): ~~The composition of claim 19,~~
A composition for an implant, comprising:

a biocompatible material coated on a structured surface
affixed to a substrate;

wherein the structured surface includes a plurality of
undercuts, and said biocompatible material coats the plurality
of undercuts in the structured surface;

wherein the coating is formed by a thin film technique adapted to deposit the coating on line-of-sight hidden surfaces within said plurality of undercuts of the structured surface;
and

wherein ~~said~~ the structured surface is porous and said biocompatible material coats interconnected pores ~~beneath said~~ within the structured surface.

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Claim 28 (currently amended): The composition of claim 19 ~~21~~, wherein ~~said~~ the substrate includes at least one material selected from the group consisting of carbon-composite, stainless steel, cobalt-chromium, titanium alloy, tantalum, and ceramic.

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Claim 29 (currently amended): ~~The composition of claim 19,~~
A composition for an implant, comprising:

a biocompatible material coated on a structured surface
affixed to a substrate;

wherein the structured surface includes a plurality of undercuts, and said biocompatible material coats the plurality of undercuts in the structured surface;

wherein the coating is formed by a thin film technique adapted to deposit the coating on line-of-sight hidden surfaces within the plurality of undercuts of the structured surface; and

wherein ~~said~~ the structured surface is defined by a material that includes a plurality of particles that are sintered together to form a continuous porous phase.

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Claim 30 (currently amended): ~~The composition of claim 19,~~ A composition for an implant, comprising:

a biocompatible material coated on a structured surface affixed to a substrate;

wherein the structured surface includes a plurality of undercuts, and said biocompatible material coats the plurality of undercuts in the structured surface;

wherein the coating is formed by a thin film technique adapted to deposit the coating on line-of-sight hidden surfaces within the plurality of undercuts of the structured surface; and

wherein ~~said~~ the structured surface is prepared by at least one method selected from the group consisting of sintering, flame spraying, acid etching, grit blasting, casting-in, forging-in, laser texturing, and micromachining.

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Claim 31 (currently amended): The composition of claim 19
27, wherein said biocompatible coating includes at least one
material selected from the group consisting of titanium,
tantalum, carbon, calcium phosphate, zirconium, niobium,
hafnium, hydroxyapatite, and tissue in-growth and/or on-growth
facilitating proteins.

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Claim 32 (currently amended): The composition of claim 19
27, wherein said biocompatible coating includes multi-layers.

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Claim 33 (currently amended): The composition of claim 19
27, wherein said biocompatible coating includes nano-layers.

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Claim 34 (currently amended): An osteoconductive process,
comprising contacting a bone under in vivo conditions with ~~said~~
the composition of claim 19 27. 14

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Claim 35 (currently amended): An orthopedic implant,
comprising ~~said~~ the composition of claim 19 27. 14

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Claim 36 (currently amended): A method for orthopedic surgery which comprises positioning ~~said~~ the composition of claim ~~19~~ ²⁷ within a vertebrate in need thereof.
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[Claim 37 (canceled).]

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Claim 38 (currently amended): The implant of claim 37 ³¹⁷ ~~47~~, wherein said biocompatible coating is more biocompatible than said structured surface.

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^{33 41}
Claim 39 (currently amended): The implant of claim 37 ³¹⁷ ~~47~~, wherein said biocompatible coating is more biocompatible than said substrate.

^{34 42}
Claim 40 (currently amended): The implant of claim 37 ³¹⁷ ~~47~~, wherein said biocompatible coating is softer than said structured surface.

^{35 43}
Claim 41 (currently amended): The implant of claim 37 ³¹⁷ ~~47~~, wherein said biocompatible coating is softer than said substrate.

[Claim 42 (canceled).

³⁶/₃₇ Claim 43 (currently amended): The implant of claim ³¹/₃₇ ~~37~~ 47, wherein ~~said~~ the thin film technique includes at least one deposition process selected from the group consisting of physical vapor deposition and chemical vapor deposition.

[Claim 44 (canceled).

B6 ⁴⁵/₃₇ Claim 45 (currently amended): The implant of claim ³¹/₃₇ ~~44~~ 47, wherein said structured surface is porous and said biocompatible ~~material~~ coating coats interconnected pores ~~beneath~~ within said structured surface.

Cont ⁴⁶/₃₈ Claim 46 (currently amended): The implant of claim ³¹/₃₇ ~~37~~ 47, wherein said substrate includes at least one material selected from the group consisting of carbon-composite, stainless steel, cobalt-chromium, titanium alloy, tantalum, and ceramic.

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Claim 47 (currently amended): ~~The implant of claim 37, An~~
implant, comprising:

a substrate;

a structured surface formed on a portion of said substrate;

and

a biocompatible coating deposited on at least a fraction of
said structured surface;

wherein said structured surface includes a plurality of
undercuts, and said biocompatible coating coats the plurality of
undercuts in said structured surface;

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wherein said coating is formed by a thin film technique
adapted to deposit said coating on line-of-sight hidden surfaces
within the plurality of undercuts of said structured surface;

wherein the portion of said substrate is to be fixed with
tissue-in-growth and/or on-growth for stability; and

wherein said structured surface is defined by a material
that includes a plurality of particles that are sintered
together to form a continuous porous phase.

45/53
Claim 48 (currently amended): ~~The implant of claim 37, An~~
implant, comprising:

a substrate;

a structured surface formed on a portion of said substrate;

and

a biocompatible coating deposited on at least a fraction of
said structured surface;

wherein said structured surface includes a plurality of
undercuts, and said biocompatible coating coats the plurality of
undercuts in said structured surface;

wherein said coating is formed by a thin film technique
adapted to deposit said coating on line-of-sight hidden surfaces
within the plurality of undercuts of said structured surface;

wherein the portion of said substrate is to be fixed with
tissue-in-growth and/or on-growth for stability; and

wherein said structured surface is prepared by at least one
method selected from the group consisting of sintering, flame
spraying, acid etching, grit blasting, casting-in, forging-in,
laser texturing, and micromachining.

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Claim 49 (currently amended): The implant of claim 37/47,

wherein said biocompatible coating includes at least one
material selected from the group consisting of titanium,

tantalum, carbon, calcium phosphate, zirconium, niobium, hafnium, hydroxyapatite, and tissue in-growth and/or on-growth facilitating proteins.

~~48~~ 40
Claim 50 (currently amended): The implant of claim 37 ~~31~~ 37
wherein said biocompatible coating includes multi-layers.

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Claim 51 (currently amended): The implant of claim 37 ~~31~~ 37
wherein said biocompatible coating includes nano-layers.

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~~50~~ 42
Claim 52 (currently amended): The implant of claim 37 ~~31~~ 37
wherein said the implant is an orthopedic prosthesis.

~~51~~ 43
Claim 53 (currently amended): A method for orthopedic surgery which comprises surgically positioning ~~said~~ the implant of claim 37 ~~31~~ 37 within a vertebrate in need thereof.

~~52~~ 44
Claim 54 (currently amended): An osteoconductive process, comprising contacting a bone under *in vivo* conditions with ~~said~~ the implant of claim 37 ~~31~~ 37.

[Claims 55-75 ^{46/54} withdrawn).

Claim ^{46/54} 76 (allowed): An implant, comprising:

a substrate;

a structured surface formed on at least a portion of said substrate; and

a biocompatible coating deposited on at least a fraction of said structured surface;

wherein said structured surface is defined by a material that includes a plurality of particles that are sintered together to form a continuous porous phase.

^{47/55}
Claim 77 (allowed): A composition for an implant, comprising:

a biocompatible material coated on a structured surface defined by a substrate;

wherein said structured surface is defined by a material that includes a plurality of particles that are sintered together to form a continuous porous phase.

^{48/54}
Claim 78 (allowed): An implant comprising:
a substrate;

a structured surface formed on a portion of said substrate;
and

a biocompatible coating deposited on at least a fraction of
said structured surface,

wherein said portion of said substrate is to be fixed with
tissue in-growth and/or on-growth for stability; and

wherein said structured surface is defined by a material
that includes a plurality of particles that are sintered
together to form a continuous porous phase.

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Claim ~~78~~ (new): An implant, comprising:

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Cont a substrate;

a structured surface formed on at least a portion of said
substrate; and

a biocompatible coating deposited on at least a fraction of
said structured surface;

wherein said structured surface is defined by a material
that includes a plurality of particles that are sintered
together to form a continuous porous phase; and

said biocompatible material penetrates the continuous
porous phase through said structured surface to said substrate

so as to coat the continuous porous phase on line-of-sight hidden surfaces within said structured surface.

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Claim ~~80~~ (new): A composition for an implant, comprising:

a biocompatible material coated on a structured surface fixed on a substrate, wherein the structured surface either
(i) includes a plurality of undercuts and said biocompatible coating coats the plurality of undercuts in the structured surface, or

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^{Cond} (ii) is porous and said biocompatible coating coats interconnected pores within the structured surface; and wherein the structured surface is defined by a material that includes a plurality of particles that are sintered together to form a continuous porous phase, and said biocompatible material penetrates through the structured surface to the substrate so as to coat the continuous porous phase on line-of-sight hidden surfaces within the structured surface.

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Claim ~~81~~ (new): An implant, comprising:
a substrate;

a structured surface formed on a portion of said substrate;
and

a biocompatible coating deposited on at least a fraction of
said structured surface;

wherein the portion of said substrate is to be fixed with
tissue in-growth and/or on-growth for stability;

wherein said structured surface either

(i) includes a plurality of undercuts and said
biocompatible coating coats said plurality of undercuts in said
structured surface, or

(ii) is porous and said biocompatible coating coats
interconnected pores within said structured surface; and

wherein said structured surface is defined by a material
that includes a plurality of particles that are sintered
together to form a continuous porous phase, and said
biocompatible coating penetrates through said structured surface
to said substrate so as to coat said continuous porous phase on
line-of-sight hidden surfaces within said structured surface.